THE CONTRIBUTIONS OF ORAL LANGUAGE COMPONENTS TO READING COMPREHENSION IN EARLY ELEMENTARY STUDENTS

by

Kathleen Walsh

Submitted in partial fulfilment of the requirements
for the degree of Master of Arts in School Psychology

at

Mount Saint Vincent University
Halifax, Nova Scotia
September 2020

© Copyright 2020 by Kathleen Walsh

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Reading is a complex skill that is foundational to children's learning in school. One popular theory of reading comprehension is the Simple View of Reading. This model posits that reading comprehension is comprised of listening comprehension and decoding skills. Listening comprehension, however, may not capture the breadth of oral language skills needed to develop reading comprehension. Alternative theories of reading comprehension identify a number of oral language skills that are involved in reading comprehension. The current study examines whether vocabulary, syntactic awareness, and morphological awareness each uniquely contribute to reading comprehension in concurrent and later reading comprehension for students who began the study in Grade 1. In separate hierarchical regressions, each oral language skill contributed significant unique variance to Grade 1 reading comprehension after that accounted for by listening comprehension and decoding. Each oral language skill did not account for variance with the other two oral language skills also in the equation; however, the small sample size may have limited these findings. The current study supports the theory that oral language skills contribute to reading comprehension beyond decoding and listening comprehension, supporting a more detailed theory of reading comprehension. The findings will be discussed in relation to the current research and theoretical frameworks of reading comprehension.

Keywords: reading comprehension, oral language, early elementary

Introduction

Reading is a complex skill that is an integral part of the learning process for children in all academic subjects. There are two different skill sets that children develop as they are learning to read: code related skills and oral language skills. Code related skills include phonological awareness, phonological decoding, and spelling. Oral language skills include, for example, receptive and expressive vocabulary, syntactic knowledge, and understanding conversational and story discourse (NICHD Early Child Care Research Network, 2005). There are different ways of conceptualizing these skills within a theory of reading acquisition.

One of the most popular models, the Simple View of Reading, states that reading consists of two components: decoding and linguistic comprehension (Hoover & Gough, 1990). Decoding refers to the ability to decipher the printed letters and transform these into spoken words (Hoover & Gough, 1990). Skilled readers are able to look at a written word and quite automatically decode it – that is, gain access its pronunciation and meaning. For early readers, this skill is largely phonologically-based and involves using knowledge of sound-letter relationships to correctly pronounce unfamiliar printed words – which are frequent for beginning readers. Decoding ability is most frequently assessed, through children's reading of pseudowords. Linguistic comprehension is the ability to take information at the word, sentence, and conversation level and understand its meaning. This does not mean that reading is a simple process, as both these skill sets are quite complex. According to the Simple View of Reading, both of these skill sets are equally important. These two component abilities are necessary for reading development, and neither component is sufficient on its own. That is, skill in both decoding and linguistic comprehension are needed to understand texts (Hoover & Gough, 1990).

The Simple View of Reading has been supported by research (e.g., Catts et al., 1999; Chiu & Cain, 2018; Solari et al., 2018). For example, in a study that examined how well pre-kindergarten oral language and code related skills predicted later reading, it was found that listening comprehension and word reading accounted for 94% of the variance in Grade 3 reading comprehension (Chiu & Cain, 2018). It has been suggested that as word recognition becomes more accurate and fluent, the contribution of individual differences in word recognition to reading comprehension decreases and the contribution of listening comprehension skills increase (Chiu & Cain, 2018). Thus, longitudinal research has shown continuity between pre-kindergarten oral language and decoding skills and reading comprehension. Furthermore, decoding, listening comprehension, and fluency in early Grade 1 all contributed variance to concurrent reading comprehension (Solari et al., 2018). A number of studies have supported that the two constructs in the Simple View of Reading contribute unique and substantial variance to reading comprehension in early elementary school children (e.g., Catts et al., 1999; Chiu & Cain, 2018; Solari et al., 2018). The goal of the current study is to examine the relationship between oral language and reading comprehension in a more in-depth manner. This will be done by controlling for decoding and listening comprehension to allow us to examine the contribution of individual oral language skills to reading comprehension.

A study by Catts and colleagues (1999) illustrates the importance of both major components in the Simple View of Reading. They examined the effect of phonological processing (a proxy for decoding skills) and language abilities measured in kindergarten on reading comprehension in Grade 2. First, they found that children who were classified as poor readers in Grade 2 showed deficits in both kindergarten phonological skills (phonological awareness and rapid naming) and kindergarten language skills (including expressive and

receptive language, vocabulary, grammar, and oral narrative comprehension), when compared to students who were classified as good readers in Grade 2. The authors also examined the amount of unique variance that kindergarten phonological and language skills contributed to Grade 2 reading comprehension. While both components were important, they concluded that oral language in kindergarten had a stronger relationship with reading comprehension than did phonological skills (Catts et al., 1999). This study shows that oral language skills are important in the performance of both typical and poor readers, and that they play an important role in reading comprehension for young children. To further this research, the current study examines the contribution of individual oral language skills to reading comprehension beyond that accounted for by decoding.

Despite the research supporting the Simple View of Reading, it is not without its critics. The main criticism of the Simple View that informs the current study is that it does not explicitly define what linguistic comprehension involves (Kirby & Savage, 2008). In the classic Simple View of Reading, linguistic comprehension is operationalized with a listening comprehension measure (e.g., Hoover and Gough, 1990). Listening comprehension may encompass a variety of separate skills involved in oral language, and the Simple View of Reading is not clear about which language skills are important to reading comprehension (Kirby & Savage, 2008). It has been argued that the Simple View of reading oversimplifies reading comprehension (Kirby & Savage, 2008). Reading comprehension is one of the most intricate cognitive processes that humans engage in and may be influenced by many different variables, including cognitive characteristics of the reader, the text being read, and the demands of the reading task or goals (Catts, 2018). Furthermore, the aspects of oral language skills that contribute to reading comprehension need to be further explored.

Another model of reading development is Scarborough's Rope Model (2001). The Rope Model of Reading proposes that reading skills develop somewhat separately (individual strands of the rope), and weave together as children become more skilled readers. The two main strands of the rope are language comprehension and word recognition, similar to the two components of the Simple View of Reading. The Rope Model, however, proposes that each of these constructs are made up of individual skills which are separable and may be differentially related to reading comprehension. In this model, word recognition is composed of phonological awareness, decoding and sight-word recognition. For the focus of this study, Scarborough's description of the oral language comprehension is most relevant. She describes language comprehension as comprised of one's skill or knowledge in the areas of content or background knowledge, vocabulary, language structure (e.g., grammar, morphology), verbal reasoning, and knowledge of print concepts and literary genres (Scarborough, 2001).

Consistent with Scarborough's model, it has been proposed that different aspects oral language comprehension may contribute to reading comprehension independently (e.g., Kendeou et al., 2009). The most frequently identified aspects of oral language comprehension in the context of studying reading comprehension are vocabulary, syntax, and morphology (Metsala et al., 2020). In a study conducted with first-grade French students, vocabulary and grammar were found to be distinguishable oral language skills (Massonié et al., 2019). Similarly, a factor analysis with Grade 1 students found that vocabulary and syntax were distinct constructs (Foorman, 2015), and these were predictive of later reading comprehension. These results suggest that aspects of oral language are different skills and should be examined as individual components and contributors to reading comprehension. Metsala and colleagues (2020) proposed the componential hypothesis to describe the oral language contributions to reading

comprehension. This hypothesis predicts that aspects of oral language each make independent contributions to reading comprehension, beyond those of word decoding. Furthermore, they suggested that a strict test of the hypothesis would also control for a measure of listening comprehension. By controlling for listening comprehension, the componential hypothesis (Metsala et al., 2020) tests whether additional oral language skills are needed to explain children's reading comprehension. In such a case, this would mean that the Simple View of Reading (Hoover & Gough, 1990) over-simplifies the oral language skills needed for reading comprehension.

Researchers have examined how various combinations of oral language components affect reading comprehension. Silverman et al. (2015) conducted a longitudinal study with both English-only and bilingual (English/Spanish) students, following them from second to fifth grade. Students were assessed on word recognition, vocabulary breadth and depth, syntactic skills, morphological awareness, and reading comprehension in the fall and the spring of each year. This study found that initial syntactic skills and vocabulary depth were uniquely predictive of outcomes in reading comprehension. That is, children with stronger syntactic skills and vocabulary knowledge in Grade 2 had better reading comprehension skills at the end of Grade 5. This study, however, did not find a unique contribution from initial morphological awareness to later reading comprehension (Silverman et al., 2015).

Gottardo and colleagues (2018) conducted a study with 9-13-year-old Spanish speaking, English language learners and found that vocabulary and syntactic knowledge contributed unique variance to reading comprehension beyond word reading, again with no significant contribution from morphological skills. They reported that vocabulary, morphological awareness, and syntactic knowledge accounted for a combined 66.8% of variance seen in reading

comprehension, with both vocabulary and syntactic knowledge being significant, unique predictors. A mediation analysis was conducted to examine how the effects of morphology and vocabulary overlap. It was found that the effects of morphological awareness were significantly reduced when vocabulary was controlled; that is, the contribution of morphological awareness to reading comprehension was found to be partially mediated by vocabulary in their study. This indicates that there is shared variance between vocabulary and morphological awareness, and when decoding and syntax is also controlled, only vocabulary had independent role in reading comprehension (Gottardo et al., 2018).

Muter and colleagues (2004) focused on younger children, examining the predictive ability of oral language skills in preschool to later reading skills in early elementary school. A total of 90 children, initially four years of age, completed measures at three evenly spaced points over the course of two years. From a path analysis, they found that grammatical awareness (morphological and syntactic awareness combined), vocabulary knowledge, and early word recognition accounted for 86% of the variance seen in later reading comprehension. They found that grammatical awareness and vocabulary knowledge had similar contributions (Muter, Hulme, Snowling & Stevenson, 2004). This study supports the notion that the components of oral language found to be important in older students (e.g., Grades 3-6 and beyond; e.g., Deacon & Kieffer, 2018; Gottardo et al., 2018; Silverman et al., 2015), are also relevant to reading comprehension in younger students. I next briefly define each of these three aspects of oral language, and the importance of their relationship to reading comprehension.

Vocabulary

Vocabulary is an integral part of oral language and has been shown to be important in the development of a variety of reading skills (Biemiller, 2003; Juel et al., 2003; Verhoeven et al.,

2011). One of two aspects of oral vocabulary are most often examined: receptive vocabulary and expressive vocabulary. Receptive vocabulary involves understanding words that are heard, while expressive vocabulary involves producing words through speech (Jalongo & Sobolak, 2011). It is believed that young children are able to understand four times as many words as they are able to produce (Jalongo & Sobolak, 2011). Vocabulary development has been found to be quite stable throughout childhood (Bornstein et al., 2016; Verhoeven et al., 2011). In a longitudinal study that followed children from Grades 1 through 6, it was found that early vocabulary was predictive of later reading comprehension (Verhoeven et al., 2011). Another longitudinal study examined children from 19 months to 16 years of age, assessing vocabulary at regular intervals during that time. Early literacy skills were measured at four and five years of age and reading comprehension skills were measured at 12 and 16 years of age. It was found that early vocabulary was correlated with children's reading comprehension at age 12 (Suggate et al., 2019).

It has been proposed that vocabulary is a necessary component of teaching children to read and developing reading comprehension (Biemiller, 2003). Children often hear many more words read aloud than they are able to understand. Teaching vocabulary is necessary for children to understand the texts they are able to decode (Biemiller, 2003). It is important that children have a well-developed vocabulary as they begin to learn how to read, as a lack of word knowledge will negatively influence reading comprehension (Juel et al., 2003). Children with smaller vocabularies may struggle with reading compared to children who have larger vocabularies, causing children with smaller vocabularies to fall behind in reading (Jalongo & Sobolak, 2011). However, many studies examining the contributions of vocabulary to reading

comprehension in young children have done so in isolation from other language skills or over longer periods of time (e.g. Suggate et al., 2019; Verhoeven et al., 2011).

Syntactic Awareness

Syntactic knowledge or awareness is another important component of oral language that has been found to contribute to reading development (Chik et al., 2012; Lonigan & Millburn, 2017). Syntax refers to the set of rules that determine how individual words are combined into larger, meaningful combinations such as phrases and sentences (Brimo et al., 2017). There are two ways that studies have examined individual differences in children's syntactic skills; syntactic awareness and syntactic knowledge. Syntactic awareness is concerned with a person's explicit knowledge of language, the ability to use the rules of language to judge grammatical correctness and to manipulate and correct sentences. Syntactic knowledge measures a person's implicit knowledge of language, the ability to use rules to help understand and generate grammatical sentences (Brimo et al., 2017).

In a study done with Mandarin-speaking children from Grades 1 and 2, it was found that children's syntactic awareness was an early predictor of reading comprehension beyond variance accounted for by phonological processing, morphological skills, and orthographic skills (Chik et al., 2012). Researchers have proposed that poor syntactic awareness may be a contributing factor to poor reading comprehension as children get older (Deacon & Kieffer, 2018; Tunmer et al., 1987). When young skilled readers were matched with older struggling readers, it was found that the strong younger readers performed better on measures of syntactic awareness than the older, less capable readers (Tunmer et al., 1987). Furthermore, for Grade 3 and 4 students, syntactic awareness made significant contributions to reading comprehension after vocabulary, morphological awareness, phonological awareness and non-verbal reasoning were accounted for

(Deacon & Kieffer, 2018). This last study also found that syntactic awareness made a similar sized contribution to reading comprehension as word reading skills, an established predictor of reading comprehension.

A meta-analysis examined how different methods of measuring syntactic skills influence the performance of both poor and strong readers on the measures (Brimo et al., 2017). This synthesis reported that syntactic knowledge assessments were more common than syntactic awareness assessments, and that all syntactic awareness assessments were researcher created rather than standardized instruments. Groups of children with below average versus average reading comprehension scored differently on spoken measures of syntactic skills; however, this meta-analysis found that below average readers and average readers differed on measures of syntactic knowledge and not syntactic awareness. This is one possible reason for some inconsistency seen within the literature, as studies with different outcomes may have measured syntactic knowledge versus syntactic awareness (Brimo et al., 2017). Given the focus on syntactic awareness in studies with older students (e.g., Deacon & Kieffer, 2018), the current study also examined syntactic awareness.

Morphological Awareness

A third component of oral language skills is morphological awareness. Morphemes are the smallest meaningful units of sound in language. There are two different types of morphology frequently examined: inflections and derivations (Kirby et al., 2012). Inflections refer to additions to a base morpheme that change the structure or tense of the word, but do not change the grammatical class (e.g. -ed to play; play and played remain verbs). Derivations involve creating a new word from the base word by adding morphemes that change the meaning and may change the class. An example of this would be adding -ful to play, changing it from a verb to an

adjective (i.e., play to playful; Kirby et al., 2012). Morphological awareness is the awareness of morphemes and one's ability to manipulate these within the language (Deacon et al., 2014). It has been established that morphological awareness is related to developing literacy skills (Carlisle, 2010). Morphological awareness has been found to predict reading comprehension in Grade 3, even when word reading, vocabulary, morphological decoding, and morphological analysis have been accounted for (Levesque et al., 2017).

Kirby and colleagues (2012) conducted a study with 103 students that were followed from Kindergarten to Grade 3. They examined the contribution of morphological awareness to children's reading development at each of the time point across the four years, controlling for phonological awareness and IQ. This study found that in Grade 1, there was no significant contribution of morphological awareness to any aspect of reading. In Grade 2, morphological awareness accounted for 2-4% percent of unique variance, and in Grade 3 it accounted for 3-9% unique variance, with the largest effect for reading comprehension measures. An additional analysis was conducted to see if this effect would remain after word reading was controlled. They found that 2-3% of the unique variance in Grade 3 reading comprehension could be accounted for by morphological awareness. These researchers proposed that morphological awareness may not play a role in reading in younger ages but is important from Grade 2 onwards. It is possible, however, that the morphological awareness tasks used in this study were too difficult for the youngest children (Kirby et al., 2012). Thus, it is not clear whether morphological awareness makes a unique contribution to reading comprehension in young children and further research is relatively limited in this area.

Robertson and Deacon (2019) examined the contributions of morphological awareness to word level reading in children between Grades 1 through 4. They measured morphological

awareness through awareness of past tense, done with both real verbs and pseudoverbs. A total of 375 children participated in this study. It was found that morphological awareness contributed a small but significant 1.1% of unique variance to word reading ability in Grades 1 and 2, but did not contribute any significant variance to word reading in Grades 3 and 4. In this study children completed an inflectional morphology task, also used in the current study. Robertson and Deacon's (2019) study supports that awareness of inflectional morphology influences at least one aspect of children's reading as early as Grade 1.

Current Study

The purpose of this study was to examine the contributions of separate components of oral language to reading comprehension in young children. Both concurrent and longitudinal relationships between individual aspects of oral language and reading comprehension were examined. The existing literature in this area is limited in several ways. First, there is little consensus on the unique contributions of different oral language skills to reading comprehension in young children. Second, much of the existing literature on the effects of oral language skills on reading comprehension is focused on older students, and this study seeks to help fill this gap in the existing literature. Third, many studies include one or two aspects of oral language, but with young children, there is very limited research examining all three aspects in one study. Furthermore, the current study will test some aspects of the componential hypothesis, but with younger children than a previous study with similar measures, methodology, and student demographics (Metsala et al., 2020).

This current study first examined whether measures of vocabulary, syntactic awareness, and morphological awareness each contributed unique variance to concurrent reading comprehension, after controlling for initial decoding and listening comprehension. Decoding was

assessed through a measure that involved reading pseudowords, ensuring that we examined a child's knowledge of letter-sound relationships and applying these to read words, rather than their ability to read a list of sight words. Furthermore, by controlling for listening comprehension we examine whether listening comprehension captures the oral language abilities needed for reading comprehension, or whether there are other components of oral language that children need to understand what they read. If the individual oral language skills are uniquely related to reading comprehension, it would indicate that linguistic comprehension is not adequately defined in the Simple View of Reading (Hoover & Gough, 1990).

Congruent with the componential hypothesis (Metsala, et al., 2020), I expected that each of vocabulary, syntax, and morphological awareness would independently contribute to variance in concurrent reading comprehension. This prediction is consistent with Scarborough's Rope Model (2001), delineating separable components of oral language comprehension in the reading comprehension process. The study next examined whether each of the 3 oral language measures predicted reading comprehension one year later, after again controlling for decoding and listening comprehension. I hypothesized that one or more of the oral language components would make an independent contribution to reading comprehension one year later.

If oral language components do predict unique variance in concurrent and longitudinal reading comprehension outcomes, after controlling for decoding and listening comprehension, there could be implications for how we think about and target oral language skills in the early literacy classroom. However, past research with young students has been inconsistent and sparse, thus the outcomes to this study will be informative. Contrary to my expectations, it could be that for young students, listening comprehension and decoding adequately describe the components of the reading process, and a more delineated model is not necessary – that is, oral language

skills may not predict independent variance in reading comprehension. This would support the Simple View of Reading for describing young children's reading comprehension (e.g., Hoover & Gough, 1990).

Method

Participants

Data from 55 students who completed Time 1 and Time 2 measures were analyzed for the purpose of this study. Sixty-six students completed year one testing. Data from eight students were removed as English was not their first language. Of the 58 remaining children, three were unavailable for testing during year two, leaving a total of 55 participants included in the sample for the study (*N*=55, 27 males). Students were recruited from several medium sized schools, from a largely suburban area in Eastern Canada. At Time 1 the students were in Grade 1 (M_{age}: 6 years, 8 months), and at Time 2 the students were in Grade 2 (M_{age}: 7 years, 7 months).

Reading Measures

Decoding Skills: Students' decoding skills were measured by the Word Attack subtest of the Woodcock Johnson III: Tests of Achievement (Woodcock et al., 2001). In this test, children were asked to read pseudowords (nonsense words) that became increasingly difficult. Testing was discontinued when students either made six consecutive errors or until they reached the final item. The manual reported split-half reliability is .94.

Reading comprehension. Grade 1 reading comprehension was measured using the Passage Comprehension subtest of the Woodcock Johnson III Tests of Achievement (Woodcock et al., 2001). Participants were asked to read a passage silently, and to fill in the word that goes in a blank space. After 6 consecutive errors testing was discontinued. The manual reported split-half reliability is .96.

Grade 2 reading comprehension was assessed using the Woodcock Reading Mastery Test III (Woodcock, 2011). For this task children read a passage of text and were then asked to indicate what word is missing from the passage. The earlier items included a picture to aid comprehension. Children were stopped after six consecutive errors. The manual reported split-half reliability is .96.

Oral Language Measures

Listening comprehension. The Understanding Spoken Paragraphs subtest of the Clinical Evaluation of Language Fundamentals 5th Ed. (Wiig, Semel & Secord, 2013) was administered to assess listening comprehension. In this test, an examiner read aloud a number of paragraphs to the student. When the examiner was done reading the passage they asked the student to respond to a number of open-ended questions about the text. The maximum score is 20, and the publisher-reported internal consistency reliability is about .80.

Morphological awareness. Morphological awareness was assessed using a measure that consisted of 20 items. The first part of the measure was 15 items from the Word Structure subtest of the CELF-5 (Wiig, Semel & Secord, 2013). In this task, students were asked to complete a spoken sentence stem while looking at a picture (e.g., Here is a boot. Here are two _____). The second word students needed to provide was morphologically related to the last word in the first sentence piece (e.g. boots). Items were taken from across the different categories on this scale (e.g., irregular plural; regular past tense, future tense, reflexive pronouns). The second part consisted of the students hearing an incorrect sentence and being asked to correct the sentence. Students then completed 5 items that required them to listen to a morphologically incorrect sentence and correct the mistake. Items were marked as correct or incorrect. All mistakes were in subject-verb agreement and required students to manipulate morphemes to correct the sentence

(e.g., *The dogs play and Matt sleep;* correct response (i) *The dog plays and Matt sleeps* or (ii) *The dogs play and Matt sleeps*). Students were given practice items with corrective feedback. The Cronbach's alpha reliability coefficient for this sample was .78.

Syntactic awareness. The syntactic awareness measure consisted of two parts. Based upon tests in previous research (Deacon & Kieffer, 2018; Siegel & Ryan, 1988), researchers read 10 sentences aloud to students who were then asked to decide whether the words in the sentences were read to them in the correct or incorrect order. The students completed practice items with feedback as to whether their response was correct (e.g., correct sentence - "The cat meows and the dog barks"; incorrect sentence: "The dog sits and stands the person"). In the second part of the task, students heard 5 sentences and were asked to change the order of the wording, so the sentences made sense. Students were provided a practice item with corrective feedback (sample sentence: "The buses stop and go the trains."). The maximum score for this measure was 15. The Cronbach's alpha reliability coefficient for this sample was .78.

Vocabulary. Receptive vocabulary was measured with a shortened version of the Peabody Receptive Vocabulary Test (PPVT-IV; Dunn & Dunn, 2007), similar to the procedure used by Deacon and colleagues (2014), and previously validated with young children (Deacon et al., 2013). The shortened version had children respond to every third item, with the items being administered following the directions in the manual. This test has a maximum score of 76. The starting point is dependent on age and the testing was discontinued after the student made 6 consecutive errors. Scoring was done according to the manual. In a sample from the same schools, Cronbach's alpha reliability coefficient was reported to be .70.

Procedure

Testing was conducted by trained research assistants. Children completed all tasks in a quiet room in their school. Time 1 testing consisted of two approximately 40-minute sessions. Time 2 testing consisted of one short individual session for individual measures and one small group (2-3 children per group) session, for the completion of a group administered task not reported in this study.

Results

Descriptive Statistics

Prior to conducting analyses to address study questions, the data were examined for missing values and distributions were checked for normality. Overall, there were 3 missing data points, representing less than 1% of the total data. These were replaced with the group mean in the analyses. All variables but one were normally distributed (George & Mallery, 2010). Word Attack was mildly skewed, this was corrected using a log transformation. This log transformed variable was used in all analyses, as were raw scores from all the other variables. Means and standard deviations for the reading and oral language measures are reported in Table 1. As can be seen, for standardized reading measures, group mean standard scores fell within the average range for each test (i.e., Word Attack, Reading Comprehension).

The zero-order correlations among the raw scores for all the major variables in this study are presented in Table 2. Listening comprehension was significantly correlated with all other oral language measures (vocabulary, syntactic awareness, morphological awareness). In turn, each of these oral language measures was significantly correlated with the other. Both vocabulary and morphological awareness were significantly correlated to Time 1 and Time 2 reading comprehension. Syntactic awareness was not significantly correlated with reading comprehension. To address the research questions regarding the relationships between these

three oral language components and reading comprehension, I next conducted a number of hierarchical regressions.

Contributions of Oral Language Components to Concurrent Reading Comprehension

The first series of analyses were conducted to examine whether each of the oral language components predicted variance in concurrent reading comprehension, after controlling for variance associated with decoding and listening comprehension. In these regressions, word attack (decoding) was entered as Step 1 and listening comprehension was entered at Step 2. Each oral language component was entered as Step 3, in 3 separate regressions. As can be seen in Table 3, word attack and listening comprehension accounted for 55.1% of the variance in concurrent reading comprehension. When added as Step 3, vocabulary accounted for a significant additional 4.4% of the variance (see Table 3, Regression 1). When added as Step 3, syntactic awareness added a significant additional 4.6% of the variance seen in reading comprehension (Table 3, Regression 2). Similarly, morphological awareness accounted for a significant additional 6.5% of variance in reading comprehension when added as Step 3 (Table 3, Regression 3).

In order to test whether each oral language component would contribute unique variance to reading comprehension with the other individual oral language skills also in the equation, a final regression analysis was completed. Steps 1 and 2 were the same as the previously regressions, and then vocabulary, syntactic awareness and morphological awareness were entered as Steps 3, 4, and 5, respectively. As can be seen in Table 3 (Regression 4), vocabulary and syntax accounted for a significant and additional 4% and 3 % of the variance in each of Step 3 and 4. When entered as Step 5, morphological awareness accounted for an additional 3% of variance, but this failed to reach conventional levels of statistical significance (p=.066). In the

final equation with all 3 oral language skills in the equation, none were statistically significant. Therefore, in accounting for variance above that attributed to decoding and to listening comprehension, these three aspects of oral language would appear to account for common or overlapping variance in reading comprehension.

Contributions of Oral Language Components to Later Reading Comprehension.

The next set of regressions were conducted to examine the contributions of the oral language skills at mid-Grade 1 to children's mid-Grade 2 reading comprehension. In these regressions, decoding and listening comprehension were entered as Step 1, with each oral language component entered into separate regressions in Step 2. As seen in Table 4, Time 1 decoding and listening comprehension accounted for 34.7% of variance in Time 2 reading comprehension. As Step 2, vocabulary accounted for an additional 4.1 percent of variance, but did not meet conventional levels of statistical significance (p=.069). Syntactic awareness did not contribute to variance in later reading comprehension when entered as Step 2 (Table 4; Regression 2). As seen in Table 4 (Regression 3), the contribution of morphological awareness approached traditional levels of statistical significance, accounting for 4.6% of variance in Time 2 reading comprehension *(*p= .055). While vocabulary and morphological awareness failed to reach conventional levels of statistical significance, the limited sample size may play a role.

We then examined the contributions that the oral language components had to Time 2 reading comprehension when all three were entered in one regression equation and, not surprisingly, found that none were significant when all three were in the equation. While it would be logical to next test for the prediction of change in reading comprehension across the year, when Time 1 reading comprehension was added as a control variable, it was found that

none of the oral language components contributed significant variance in Time 2 reading comprehension.

Discussion

The purpose of this study was to examine the contribution that oral language makes to reading comprehension in the early elementary school years. This was done through examining the contribution of Grade 1 oral language components to reading comprehension, both concurrently and approximately one year later when the students were in Grade 2. I controlled for decoding and listening comprehension in order to examine whether the contribution of the components of oral language are beyond listening comprehension. If not, then an overarching measure of oral language, such as listening comprehension, would be adequate for understanding the reading comprehension of young children, as proposed in the Simple View of Reading (Gough & Tunmer,1990). On the other hand, Scarborough's Rope Model (2001) and the componential hypothesis (Metsala et al., 2020) stress the importance of individual oral language skills in understanding children's reading comprehension. The specific oral language components that are viewed as central to oral language skills and development are namely, vocabulary, syntactic awareness, and morphological awareness.

For Grade 1 students, the first regression analyses showed that decoding and listening comprehension accounted for 55% of the variance in concurrent reading comprehension. In separate regression equations, each of the three oral language skills contributed significant variance to concurrent reading comprehension, above the variance accounted for by decoding and listening comprehension. These findings lend support to the componential hypothesis (Metsala et al., 2020) and Scarborough's Rope Model (2001). While decoding contributed a substantial portion of the variance seen in reading comprehension, the individual oral language

skills each contributed additional variance. By further examining other oral language skills (in this case vocabulary, morphological awareness, and syntactic awareness), we hope to explain additional variance in reading comprehension and highlight the importance of these individual oral language skills.

Examining all three oral language skills in the same regression equation, we first saw that syntactic awareness accounted for additional variance beyond decoding, listening comprehension, and vocabulary. In the final equation, the 2% of independent variance accounted for by morphological awareness failed to reach conventional levels of statistical significance (p=.066). This could signify that the shared variance between the morphological awareness and the two other oral language skills are what is important in contributing to reading comprehension beyond listening comprehension. On the other hand, the limited sample size may also have played a role in the contribution of morphological awareness not being statistically significant. This will be discussed further in the limitations section.

We also sought to examine whether each oral language component measured in Grade 1 would predict independent variance in later Grade 2 reading comprehension. Three regression analyses were completed, with decoding and listening comprehension accounting for about 35% of the variance in later reading comprehension. When entered in the next step, both vocabulary and morphological awareness approached, but failed to meet, conventional levels of statistical significance (p =0.07 and p= 0.06, respectively). I next discuss each of the findings from this study in relation to the existing research on the effects of vocabulary, syntactic awareness, and morphological awareness on reading comprehension. This study indicates that specific oral language components contribute variance to concurrent reading comprehension in early elementary, beyond that of a broad oral language measure such as listening comprehension. This

would suggest that more detailed models of oral language in reading comprehension, such as Scarborough's Rope Model (Scarborough, 2001), better explain young children's reading comprehension, than the coarser Simple View of Reading (Hoover & Gough, 1990).

Vocabulary was shown to contribute significant variance to concurrent reading comprehension beyond the control measures, and the contribution to later reading comprehension approached conventional levels of significance. Existing research has shown that vocabulary has an important role in the development of reading comprehension. Studies that have found a strong relationship between in early elementary (e.g. kindergarten-Grade 2) vocabulary and later elementary (e.g. Grade 4-6) reading comprehension (Verhoeven et al., 2011; Suggate et al., 2019) have done so over years, unlike our study which was predicting reading comprehension just one year later. It is possible that the contribution of oral language skills to reading comprehension become stronger as children age, but in a sample as young as the one used in our study, decoding skills might obscure the role of vocabulary. In the other studies, vocabulary was the only oral language component included, and the controls were not as stringent as they were in the current study (e.g., Verhoeven et al., 2011; Suggate et al., 2019). Nonetheless, vocabulary did contribute to concurrent reading comprehension, beyond the controls of decoding and listening comprehension – showing that vocabulary knowledge is important in the reading comprehension of these young students.

In this study vocabulary did not predict concurrent reading comprehension beyond variance accounted for by morphological awareness and syntactic awareness. Gottardo and colleagues (2018) found that the effects of morphological awareness on reading comprehension were largely mediated by those of vocabulary in a study examining contributions to reading comprehension in a later elementary age group. Similarly, shared variance between the oral

language skills in our study is one possible explanation for why vocabulary was not found to contribute unique variance when added into an equation with the two other oral language skills. Metsala and colleagues (2020) found a similar pattern of results with Grade 2 and 3 students from the same schools and using a similar methodology. In that study, vocabulary did not remain a significant predictor in reading comprehension with syntactic awareness and morphological awareness also in the equation (Metsala et al., 2020).

A study that assessed both vocabulary and grammatical skills in young children is perhaps closely related to this study. Muter and colleagues (2004) found an independent relationship between both grammatical skills and vocabulary to later reading comprehension after word recognition was controlled (Muter et al., 2004); although they did not control for listening comprehension. In the current study reported here, it was also found that syntactic awareness did account for additional variance in reading comprehension beyond vocabulary and listening comprehension. Another study that followed Turkish children from the beginning of kindergarten until the end of Grade 2 found that in Grade 1, a grammatical measure that included both syntactic and morphological skills predicted unique variance in reading comprehension in Grade 1, whereas only vocabulary contributed unique variance to reading comprehension Grade 2 (Babayigit & Stainthorp, 2014). Ouellette & Beers (2010) conducted a study examining how oral vocabulary related to reading comprehension in children in Grade 1 and Grade 6. They found that in Grade 1, phonological awareness, decoding skills, and listening comprehension predicted variance in reading comprehension, but vocabulary did not. However, by Grade 6, vocabulary breadth accounted for 15.3% of variance seen in reading comprehension. They suggested that as children age their vocabulary becomes a more important predictor of reading comprehension and decoding becomes a less important predictor (Ouellette & Beers, 2010).

Vocabulary was found to have an independent contribution to concurrent reading comprehension beyond listening comprehension in our current study. However, given that it was not a significant contributor with other oral language skills in the current study, our findings may be consistent with Ouellette & Beers' (2010) proposal and we might expect that vocabulary becomes more robustly predictive of reading comprehension in older students..

In this study, syntactic awareness contributed significant variance to concurrent reading comprehension for Grade 1 children beyond variance accounted for by decoding, listening comprehension, and vocabulary. This supports examining individual oral language skills, rather than only listening comprehension, to further understand reading comprehension. Syntactic awareness did not contribute unique variance when morphological awareness was also in the regression equation, nor was it a predictor of reading comprehension one year later. Chik and colleagues (2012) found that Grade 1 syntactic skills predicted Grade 2 reading comprehension in a sample with 272 Cantonese speaking children with a similar number of variables as our study. Although that study had similar variables, the grammatical structure of English and Cantonese may account for the differences.

The contribution of syntactic awareness to reading comprehension has also been shown with children somewhat older than the children in our current study (Deacon & Keiffer, 2018; Metsala et al., 2020). Metsala and colleagues (2020) found that syntactic awareness had one of the most robust effects in their study conducted with an older sample from the same schools and using a similar methodology. In Metsala and colleagues' (2020) study, it was found that syntactic awareness had significant unique contributions to reading comprehension in children in Grades 2 and 3. Deacon and Kieffer (2018) found that syntactic awareness measured in either Grade 3 or 4 had a direct relationship to reading comprehension measured in the same year. Our study found

that syntactic awareness was able to predict variance in concurrent reading comprehension in Grade 1, and other research supports the notion that a relationship between reading comprehension and syntactic awareness continues as children age (Deacon and Kieffer, 2018; Adlof et al., 2010) Adlof and colleagues (2010) conducted a study that examined kindergarten predictors of Grade 2 and Grade 8 reading comprehension, including a variety of different language and reading skills. They found that models that predicted Grade 2 reading needed to include decoding and listening comprehension, but no other language skills. Models that predicted Grade 8 reading were best with many more predictors, including the grammatical completion task, in which children were asked to supply a correct word to complete the sentence. It is possible that grammatical skills become more important to reading comprehension as children age (Adlof et al., 2010). This could be one explanation for why syntactic awareness was not found to contribute unique variance when put into a regression equation with other oral language skills in our study, as the effect was not strong enough in the young children to remain significant amongst the other components that were assessed.

Another possible explanation for why we did not find that syntactic awareness predicted reading comprehension beyond all the oral language skills, or a year later, may be the measure of syntactic awareness itself. Brimo and colleagues (2017) conducted a meta-analysis that found that different aspects of syntactic skills may be differentially related to reading comprehension. They reported that syntactic knowledge measures differentiated between strong and poor readers, whereas measures of syntactic awareness did not (Brimo et al., 2017). A study conducted with French-speaking students by Tong and colleagues (2013) examined how poor readers (approximately age nine) performed on a measure of morphological awareness, syntactic awareness, and a measure that examined aspects of both skills. They found that children's

performance on the tasks differed depending on what measure was used. It was found that poor comprehenders differed from good comprehenders on the tasks that measured the skills separately, but not on the task that examined aspects of both skills. They also highlighted the need to further develop ways to accurately assess these oral language skills to allow us to gain a better understanding of the role they play in reading comprehension (Tong et al., 2013). It may be that syntactic knowledge is more heavily related to reading comprehension in young elementary students and may be more predictive of later reading comprehension than syntactic awareness.

In our current study, it was found that morphological awareness was perhaps most robustly related to reading comprehension of the three oral language skills. First, it accounted for 6.5% percent of the variance in concurrent reading comprehension above decoding and listening comprehension. Secondly, when entered into the equation with a complete model of oral language, morphological awareness just failed to meet conventional levels of statistical significance. Given the limited sample size, the influence of morphological awareness may be underestimated in our analyses. The variance contributed by morphological awareness to later reading comprehension also approached statistical significance. This is similar to findings by Metsala and colleagues (2020) with children in Grades 2 and 3, followed up one and two years later. That is, morphological awareness was the most robustly related to reading comprehension in that study with slightly older children and a larger sample size.

Our findings contrast with those of Kirby and colleagues (2012) who found that morphological awareness did not significantly contribute to reading comprehension in Grade 1. In that study, however, their morphological awareness task appeared very difficult for young children as the authors recognized, and these floor effects may account for their null findings.

Another study conducted by Robertson and Deacon (2019) that used a similar inflectional morphology task to the current study found that morphological awareness contributed significant variance to word reading in Grades 1 and 2; however, the study did not examine the relationship to reading comprehension.

The current study lends some support to proposals that morphological awareness is independently related to reading comprehension, even from a young age. Furthermore, these findings support the notion that reading comprehension requires skills in the individual components of oral language, more than just global listening comprehension and decoding skills -- even at this early stage of reading development. Another study has shown that morphological awareness at an early age contributes to reading comprehension in later reading. Deacon and colleagues (2018) found that morphological awareness measured at approximately six years of age contributed 7% of variance seen in reading comprehension two years later, after controlling for word reading (Deacon et al., 2018). This suggests that the contributions of morphological awareness at a young age remain important as children continue to gain skill in reading comprehension.

Theoretical Contributions and Implications of the Current Study

The research on reading comprehension, especially in younger children just learning to comprehend text, has been inconsistent with respect to whether separate oral language skills have a role to play. It was found that the three oral language skills assessed in this study (vocabulary, syntactic awareness, and morphological awareness) contributed variance to concurrent reading comprehension for Grade 1 children after accounting for variance due to decoding and listening comprehension. This supports theories of reading comprehension, such as the Scarborough's Rope Model of Reading (2001), that identify individual components of oral language. In this

study, the contributions of oral language components to later reading comprehension were not as conclusive, and this examination may have been hindered by methodological limitations, described below.

That individual oral language skills accounted for unique variance in reading comprehension argues against the Simple View of Reading (Hoover & Gough, 1990), even for young students. Listening comprehension does not capture the variance explained in reading comprehension by the individual oral language skills. The model omits important aspects of oral language that play a role in children's ability to understand the text they read. Oral language measures cannot be accurately summed up as one overarching concept of listening comprehension. In our analyses, it was found that listening comprehension was related to all three oral language skills, but did not predict variance in concurrent reading comprehension. On the other hand, all the oral language components contributed unique variance when analysed individually. Theories like Scarborough's Rope Model (2001) provide a more comprehensive and seemingly more accurate model of the skills involved in developing reading comprehension.

This study is not without limitations. One of the main limitations is the small sample size, given the number of variables in the complete regression models. A few the findings in this study came close to conventional levels of statistical significance (p=0.05) and may well have been significant with a larger sample. We were mindful of our small sample size when deciding upon how the data would be analyzed, but it is possible we had too few participants to detect small effects. Another limitation to our study was that only one dimension of syntactic skills was measured. It has been found that measures of syntactic awareness do not differentiate between strong readers and poor readers, whereas measures of syntactic knowledge have differentiated these groups (Brimo, Lund, & Sapp, 2017). Conversely, some measures of syntactic awareness

have been strongly related to reading comprehension in older students (Deacon & Kieffer, 2018). The syntactic awareness measure in the current may have drawn on both syntactic knowledge (Part 1) and syntactic awareness (Part 2), and did relate strongly to concurrent reading comprehension, beyond listening comprehension, decoding, and vocabulary. A study with young children examining both dimensions of syntactic skills could help to ferret out our differential findings for predicting concurrent versus later reading comprehension.

This study along with similar research, may have implications for the way we teach children how to read. It is important that we teach children the variety of language skills examined in this study in the early elementary years. Our study, alongside an abundance of research, supports the importance of teaching decoding skills from a young age, as a large amount of the variance seen in early reading comprehension is accounted for by decoding. Our study also shows that while decoding is important, it is not the only skill that is related to reading comprehension, even at early stages. When examining the *Nova Scotia Curriculum English Language Arts 1 Guide*, much of the curriculum is based upon teaching using semantic and syntactic cues and images to understand a text (Nova Scotia Department of Education and Early Childhood Development, 2019). This approach does not seem adequate. It appears important that children are taught vocabulary, syntax and morphology while they are in the classroom, to ensure that they have the best foundation on which to build their comprehension of texts. The current research is correlational in nature. Research examining the causal relationships of oral language components to reading comprehension using instructional studies would be valuable.

The current study may also have implications for how school psychologists assess reading comprehension related skills. A typical assessment consists of measures or listening comprehension, expressive and/or receptive vocabulary, word reading, decoding, and a variety of

reading measures (typically reading comprehension and reading fluency). Other than a basic measure of listening comprehension and vocabulary, we often do not assess for other aspects of oral language in relation to reading. If morphological or syntactic skills are measured, it is typically during an assessment of writing skills. The current study, along with previous research, shows that these oral language skills contribute to reading comprehension as early as Grade 1..Examining a wider variety of oral language skills may help to better understand why a child is struggling with comprehending texts, which would allow interventions to be more targeted at the specific skills that a child finds difficult.

In summary, this study found that each oral language components examined contributes variance to concurrent reading comprehension in early elementary students beyond decoding and listening comprehension. This suggests that a general measure of oral language, such as listening comprehension, does not sufficiently explain the oral language skills needed for effective reading comprehension. Decoding contributed over half the variance seen in concurrent reading comprehension in Grade 1 students, suggesting that especially with younger children, decoding skills are an essential part of reading comprehension. The current study supports the proposal that the individual oral language skills of vocabulary, syntactic and morphological awareness are also important to Grade 1 students reading comprehension. Further research is needed to address the continuing importance of individual oral language skills to reading comprehension over the early elementary grades.

Table 1

Descriptive statistics for all major variables in this study.

	(*N*=55)	
Measure	**Mean**	***SD***
Age in Months (Time 1)	81.40	3.58
Word Attack (Time 1)	103.20	12.59
Reading comp. (Time 1)	101.95	15.53
Word Attack (Time 2)	100.36	14.39
Reading comp. (Time 2)	99.27	12.82
Listening comprehension	9.70	2.62
Syntactic awareness	12.85	3.57
Morphological awareness	11.92	2.66
Vocabulary	42.67	5.48

Table 2

Zero-order correlations among reading and oral language measures.

Measures		1.	2.	3.	4.	5.	6.	7.	8.
1.	Age	—							
2.	Vocabulary	.27*	—						
3.	Syntactic awareness	.10	.33*	—					
4.	Morphological awareness	.01	.42**	.41*	—				
5.	Listening comprehension	-.12	.37**	.45*	.34*	—			
6.	Word Attack (Time 1)	-.16	.24	.09	.50*	.17	—		
7.	Word Attack (Time 2)	.15*	.28*	.20	.41*	.12	.77**	—	
8.	Reading comp. (Time 1)	.21	.37**	.26	.58**	.12	.74**	.84**	—
9.	Reading comp. (Time 2)	.19	.34**	.11	.48**	.14	.59**	.74**	.75**

Notes. $^{*}p < .05$, $^{**}p < .01$.

Table 3

*Hierarchical regression analyses predicting Time 1 reading comprehension (*n = *55).*

Step	Predictor	ΔR2	β	Final β
1	Time 1 Word Attack	.55**	.74**	0.61**
2	Time 1 Listening Comp	.00	-.01	-.08
	Regression 1: Vocabulary			
Regression13	Vocabulary	.04*	.23*	.23*
	Regression 2: Syntactic Awareness			
Regression23	Syntax	.05*	.24*	.24*
	Regression 3: Morphological Awareness			
Regression33	Morphological Awareness	*.07***	*.31***	*.31***
	Regression 4: All three oral language components			
Regression43	Vocabulary	*.04**	*.23**	*.15*
4	Syntax	*.03**	*.20**	*.14*
5	Morphological Awareness	*.03^*	*.21^*	*.21^*

Notes. * $p < .05$; ** $p \leq .01$; ^ $p < .07$

Table 4

*Hierarchical regression analyses predicting Time 2 reading comprehension (*n*=55).*

Step	Predictor	ΔR2	β	Final β
1	Time 1 Word Attack	0.34**	.58**	.45**
	Time 1 Listening Comp		.04	-.06
	Regression 1: Vocabulary			
Regression1 2	Vocabulary	.04^	.22^	.22^
	Regression 2: Syntactic Awareness			
Regression2 2	Syntax	.02	.05	.05
	Regression 3: Morphological Awareness			
Regression3 2	Morphological Awareness	.05^	.26^	.26^

Notes. * $p < .05$; ** $p \leq .01$; ^ $p < .07$

References

Adlof, S. M., Catts, H. W., & Lee, J. (2010). Kindergarten predictors of second versus eighth grade reading comprehension impairments. *Journal of Learning Disabilities, 43*(4), 332-345. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ889083&site=ehost-live&scope=site http://dx.doi.org/10.1177/0022219410369067

Babayigit, S., & Stainthorp, R. (2014). *Correlates of early reading comprehension skills: A componential analysis* Educational Psychology. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1029125&site=ehost-live&scope=site http://dx.doi.org/10.1080/01443410.2013.785045

Biemiller, A. (2003). Vocabulary: Needed if more children are to read well. *Reading Psychology, 24*(3/4), 323. https://doi-org.ezproxy.msvu.ca/10.1080/0270271039022729

Bornstein, M. H., Chun-Shin. H., & Putnick, D.L. (2016). Stability of core language skills across the first decade of life in children at biological and social risk. *Journal of Child Psychology & Psychiatry, 57*(12), 1434-1443. Retrieved from http://web.b.ebscohost.com.ezproxy.msvu.ca/ehost/pdfviewer/pdfviewer?vid=7&sid=1b36086c-b4fc-47b9-8f8d-a9ab3b719888%40pdc-v-sessmgr01

Brimo, D., Lund, E., & Sapp, A. (2017). Syntax and reading comprehension: A meta-analysis of different spoken-syntax assessments. *International Journal of Language & Communication Disorders, 53*(3), 431-445. doi:10.1111/1460-6984.12362

Silva, M., & Cain, K. (2015). The relations between lower and higher level comprehension skills and their role in prediction of early reading comprehension. *Journal of Educational Psychology, 107*(2), 321-331. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1061912&site=ehost-live&scope=sitehttp://dx.doi.org/10.1037/a0037769

Carlisle, J. F. (2010). Review of research: Effects of instruction in morphological awareness on literacy achievement--an integrative review. *Reading Research Quarterly, 45*(4), 464-487. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ900639&site=ehost-live&scope=sitehttp://dx.doi.org/10.1598/RRQ.45.4.5

Catts, H. W. (2018). The simple view of reading: Advancements and false impressions. *Remedial and Special Education, 39*(5), 317-323. doi:10.1177/0741932518767563

Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (1999). Language basis of reading and reading disabilities: Evidence from a longitudinal investigation. *Scientific Studies of Reading, 3*(4), 331-361. doi:10.1207/s1532799xssr0304_2

Catts, H. W., Herrera, S., Nielsen, D. C., & Bridges, M. S. (2015). Early prediction of reading comprehension within the simple view framework. *Reading and Writing: An Interdisciplinary Journal, 28*(9), 1407-1425. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1074936&site=ehost-live&scope=site http://dx.doi.org/10.1007/s11145-015-9576-x

Chik, P., Ho, C., Yeung, P., Chan, D., Chung, K., Luan, H., Lo, L., Lau, W. (2012). Syntactic skills in sentence reading comprehension among Chinese elementary school children. *Reading & Writing, 25*(3), 679-699. doi:10.1007/s11145-010-9293-4

Chiu, Y. D., & Cain, K. (2018). The simple view of reading across development: Prediction of grade 3 reading comprehension from prekindergarten skills. *Remedial & Special Education, 39*(5), 289-303. doi:10.1177/0741932518762

Deacon, S.H., Holliman, A.J., Dobson, G.J., & Harrison, E. C. J. (2018). Assessing direct contributions of morphological awareness and prosodic sensitivity to children's work reading and reading comprehension. *Scientific Studies of Reading, 22*(6),527-534. https://doi-org.ezproxy.msvu.ca/10/1080/10888438.2018.1483376

Deacon, S. H., & Kieffer, M. J. (2018). Understanding how syntactic awareness contributes to reading comprehension: Evidence from mediation and longitudinal models. *Journal of Educational Psychology, 110*(1), 72–86. https://doi.org/10.1037/edu0000198

Deacon, S. H., Kieffer, M. J., & Laroche, A. (2014). The relation between morphological awareness and reading comprehension: Evidence from mediation and longitudinal models. *Scientific Studies of Reading, 18*(6), 432-451. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1040990&site=ehost-live&scope=sitehttp://dx.doi.org/10.1080/10888438.2014.926907

Deacon, S. H., Benere, J., & Pasquarella, A. (2013). Reciprocal relationship: Children's morphological awareness and their reading accuracy across grades 2 to 3. *Developmental Psychology, 49*(6), 1113-1126. doi:10.1037/a0029474

Deacon, S. H., Tong, X., & Francis, K. (2017). The relationship of morphological analysis and morphological decoding to reading comprehension. *Journal of Research in Reading, 40*(1), 1-16. doi:10.1111/1467-9817.12056

Nova Scotia Department of Education and Early Childhood Development. (2019). *English Language Arts 1 Guide.* https://curriculum.novascotia.ca/sites/default/files/documents/curriculum-files/English%20Language%20Arts%20guide%201%20%282019%29_3.pdf

Dickinson, D. K., Golinkoff, R. M., & Hirsh-Pasek, K. (2010). Speaking out for language: Why language is central to reading development. *Educational Researcher, 39*(4), 305-310. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ887366&site=ehost-live&scope=sitehttp://dx.doi.org/10.3102/0013189X10370204

Foorman, B., Herrera, S., Petscher, Y., Mitchell, A., & Truckenmiller, A. (2015). The structure of oral language and reading and their relation to comprehension in kindergarten through grade 2. *Reading & Writing, 28*(5), 655-681. https://doi-org.ezproxy.msvu.ca/10.1007/s11145-015-9544-5

George, D., & Mallery, M. (2010). SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10a ed.) Boston: Pearson.

Gottardo, A., Mirza, A., Koh, P., Ferreira, A., & Javier, C. (2018). Unpacking listening comprehension: The role of vocabulary, morphological awareness, and syntactic knowledge in reading comprehension. *Reading and Writing, 31*(8), 1741-1764. doi:10.1007/s11145-017-9736-2

Herrera, S., Nielsen, D., Bridges, M., & Catts, H. (2015). Early prediction of reading comprehension within the simple view framework. *Reading & Writing, 28*(9), 1407-1425. doi:10.1007/s11145-015-9576-x

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal, 2*(2), 127-160. doi:10.1007/BF00401799

Jalongo, M., & Sobolak, M. (2011). Supporting young children's vocabulary growth: the challenged the benefits, and evidence-based strategies. *Early Childhood Education Journal, 38*(6), 421-429. Retrieved from http://web.a.ebscohost.com.ezproxy.msvu.ca/ehost/pdfviewer/pdfviewer?vid=6&sid=0090824e-a074-4e72-9188-9fcd4866378e%40sdc-v-sessmgr01

Juel, C., Biancarosa, G., Coker, D., & Deffes, R. (2003). Walking with Rosie: A cautionary tale of early reading instruction. *Educational Leadership, 60*(7), 12-18. Retrieved from http://search.ebscohost.com.exprozy.msvu.ca/login.aspx?direct=true&db=eric&AN=EJ666022&site=ehost-live&scope=site

Kendeou, P., van, d. B., White, M. J., & Lynch, J. S. (2009). Predicting reading comprehension in early elementary school: The independent contributions of oral language and decoding skills. *Journal of Educational Psychology, 101*(4), 765-778. doi:10.1037/a0015956

Kirby, J. R., Deacon, S. H., Bowers, P. N., Izenberg, L., Wade-Woolley, L., & Parrila, R. (2012). Children's morphological awareness and reading ability. *Reading and Writing: An Interdisciplinary Journal, 25*(2), 389-410. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ953911&site=ehost-live&scope=site http://dx.doi.org/10.1007/s11145-010-9276-5

Kirby, J. R., & Savage, R. S. (2008). Can the simple view deal with the complexities of reading? *Literacy, 42*(2), 75-82. doi:10.1111/j.1741-4369.2008.00487.x

Levesque, K. C., Kieffer, M. J., & Deacon, S. H. (2017). Morphological awareness and reading comprehension: Examining mediating factors. *Journal of Experimental Child Psychology, 160*, 1-20. doi:10.1016/j.jecp.2017.02.015

Lonigan, C. J., & Milburn, T. F. (2017). Identifying the dimensionality of oral language skills of children with typical development in preschool through fifth grade. *Journal of Speech, Language & Hearing Research, 60*(8), 2185-2198. doi:10.1044/2017_JSLHR-L-15-0402

Massonnié, J., Bianco, M., Lima, L., & Bressoux, P. (2019). Longitudinal predictors of reading comprehension in french at first grade: Unpacking the oral comprehension component of the simple view. *Learning and Instruction, 60*, 166-179. doi:10.1016/j.learninstruc.2018.01.005

Metsala, J.L., Sparks, E., Deacon, S.H., Conrad, N.J., & David, M.D. (2020). Testing componential approaches to the role of oral language in reading comprehension.

Mishra, P., Pandey, C., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia,22*(1), 67-72.

Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: Evidence from a longitudinal study. *Developmental Psychology, 40*(5), 665-681. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ684587&site=ehost-live&scope=site http://www.apa.org/journals

NICHD Early Child Care Research Network (2005) Pathways to reading: The role of oral language in the transition to reading. *Developmental Psychology, 41*(2), 428-442. doi:10.1037/0012-1649.41.2.428

Ouellette, G., & Beers, A. (2010). A not-so-simple view of reading: How oral vocabulary and visual-word recognition complicate the story. *Reading & Writing, 23(2),* 189-208. https://doi-org.ezproxy.msvu.ca/10.1007/s11145-008-9159-1

Robertson, E. K., & Deacon, S. H. (2019). Morphological awareness and word-level reading in early and middle elementary school years. *Applied Psycholinguistics, 40*(4), 1051-1071. doi:10.1017/S0142716419000134

Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy* (pp. 97–110). New York: Guilford Press.

Siegel, L. S., & Ryan, E. B. (1988). Development of grammatical-sensitivity, phonological, and short-term memory skills in normally achieving and learning disabled children. *Developmental Psychology, 24*(1), 28-37. doi:10.1037/0012-1649.24.1.28

Silva, M., & Cain, K. (2015). The relations between lower and higher level comprehension skills and their role in prediction of early reading comprehension. *Journal of Educational Psychology, 107*(2), 321-331. Retrieved from http://ezproxy.msvu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1061912&site=ehost-live&scope=site http://dx.doi.org/10.1037/a0037769

Silverman, R., Proctor, C., Harring, J., Hartranft, A., Doyle, B., & Zelinke, S. (2015). Language skills and reading comprehension in english monolingual and Spanish–English bilingual

children in grades 2–5. *Reading and Writing, 28*(9), 1381-1405. doi:10.1007/s11145-015-9575-y

Solari, E. J., Grimm, R. P., McIntyre, N. S., & Denton, C. A. (2018). Reading comprehension development in at-risk vs. not at-risk first grade readers: The differential roles of listening comprehension, decoding, and fluency. *Learning and Individual Differences, 65*, 195-206. doi:10.1016/j.lindif.2018.06.005

Suggate, S., Schaughency, E., McAnally, H., & Reese, E. (2018). From infancy to adolescence: The longitudinal links between vocabulary, early literacy skills, oral narrative, and reading comprehension. *Cognitive Development, 47*, 82-95. doi:10.1016/j.cogdev.2018.04.005

Tong, X., Deacon, S. H., & Cain, K. (2014). Morphological and syntactic awareness in poor comprehenders: Another piece of the puzzle. *Journal of Learning Disabilities, 47*(1), 22-33. https://doi-org.ezproxy.msvu.ca/10.1177/002221943509971

Tunmer, W. E., Nesdale, A. R., & Wright, A. D. (1987). Syntactic awareness and reading acquisition. *British Journal of Developmental Psychology, 5*(1), 25-34. doi:10.1111/j.2044-835X.1987.tb01038.x

Verhoeven, L., van Leeuwe, J., & Vermeer, A. (2011). Vocabulary growth and reading development across the elementary school years. *Scientific Studies of Reading, 15*(1), 8-25. Retrieved from http://web.b.ebscohost.com.ezproxy.msvu.ca/ehost/detail/detail?vid=3&sid=1d627579-4778-4250-862d-49b539d0f8aa%40sessionmgr102&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29ZT1zaXRl#AN=57420287&db=ehh

Wiig, E.H., Semel, E., & Secord, W.A. (2013). *Clinical Evaluation of Language Fundamentals —Fifth Edition (CELF-5).* Pearson.

Woodcock, R. W. (2011). *Woodcock Reading Mastery Test – 3rd Edition (WRMT-III).* Pearson

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III Tests of Achievement – 3rd Edition*. Riverside Publishing.